

Technical Note

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cc	
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Subject	SSDA Noise and Vibration Impact Assessment - Addendum

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1. Introduction

Arup have been asked on behalf of NSW to provide further clarification regarding the operational acoustic assessment within the Noise and Vibration Impact Assessment (NVIA) for the Powerhouse Ultimo Revitalisation SSDA (*PUR2-ARP-REP-AC-0001 NVIAv3.0.pdf*) [1] dated 11/03/24. This document provides further detail for cumulative operational noise assessment and management practices including triggers for low, medium and high risk activities.

2. Arup Response

The operational noise considered in Section 4.3 of the NVIA includes both patron and music noise. The exact nature of operations within the development are likely to be highly variable and may range from predominantly patron noise to quiet enjoyment of a musical performance. In light of this, these sources have been assessed independently – i.e. the results in Table 36 and 37 of the NVIA present the maximum compliant number of patrons or music level independently, not cumulatively. This approach to assessment allows for flexibility when analysing relative contributions for different program types.

Table 33 of the SSDA presents the noise source spectra used as the basis of this assessment. The following should be noted when considering the compliant patron and music noise levels presented in the SSDA.

Patron noise

- Patron noise level and spectra are calculated using the Rindell method [2]. This calculation assumes that one third of the crowd are talking using a conservatively ‘Loud’ vocal effort. Loud vocal effort is described in Cushing et al [3] as “*Typically used for issuing commands or attracting attention, expressing anger or assertiveness. For example, when addressing a large number of people in a very large room without the aid of amplification.*”

Music noise

- Music noise level and spectrum is based on measured levels taken during a stadium performance of a pop music band. This spectrum has significant ‘low end’ (or ‘bass’)

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present within the measurement and is considered conservative considering that live music of this nature is not the primary use of any of the spaces proposed. According to Fact Sheet C of the NPfI due to the spectrum used within this assessment, maximum compliant levels stated in Tables 36 and 37 include a 5dB penalty for low frequency noise.

3. Recommendations

Based on the above assumptions for music and patron noise, the assessment provided within the SSDA is considered conservative.

It is for this reason that the results and recommendations as presented in Section 4.3.2 outlining low, medium and high risk activities be taken as a guide rather than rigidly prescriptive. For example, additional patrons beyond those stated in Tables 36 and 37 may be permissible if less than one third of the total number are talking loudly or if they are using a lower vocal effort. Furthermore, the total dBA of music may also be increased if the content contains a more balanced spectrum (i.e. less low frequency energy than assumed in the SSDA).

An operational noise management plan will be developed prior to occupation. The plan will utilise the risk categories as a basis of operations and outline the measures to ensure the scheduling of exhibitions and events are classified in advance to provide sufficient notices and implement mitigations should they be required.

4. References

- [1] Arup, "Powerhouse Ultimo Revitalisation Noise and Vibration Impact Assessment," Arup, 2024.
- [2] H. Rindel, "Acoustical Capacity as a means of noise control in eating establishments," in *Joint Baltic-Nordic Acoustics Meeting*, Lyngby, 2012.
- [3] I. R. Cushing, F. F. Li, T. J. Cox, K. Worral and T. Jackson, "Vocal effort levels in anechoic conditions," *Applied Acoustics*, vol. 72, pp. 695-701, 2011.

DOCUMENT CHECKING

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